

Why Doesn't Your Company Switch to the Lean Production System?

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Introduction

There is a lot of literature (including case studies or case analysis) not only on the application of the JIT/lean system (or methods) but also on its success stories (Schonberger, 1982 & 1986; Shinohara, 1988, 1989; Hallihan et al. 1997; Prasad, 1995; Ramarapu et al. 1995; Spencer et al. 1998 Wafa et al. 1996; Zhu et al. 1995). Surprisingly, there are, to the best of our knowledge, no studies on the reasons why such an efficient system does not seem to appeal to some of those companies that apparently or obviously should feel the need to switch to it.

The JIT/lean system is known to work fine in almost all sectors of the manufacturing industry (see Shinohara, 1985, 1988, 1989) although there are those contending that the JIT/Lean system fits best the assembly type of manufacturing (SIGMA Research Association, 1996).

This paper examines the reason why scores of companies do not (seem to) pay attention to the lean system despite the fact that the system is very efficient, leads to outstanding and sustained performance, and has been around for decades.

Crucial tests

The lean system underwent its first test during the first oil crisis of the 1970s. At that time, it came to be known as JIT/Kanban system or Toyota Production System (TPS).

“The oil crisis in the fall of 1973, followed by a recession, affected government, business and society the world over. By 1974, Japan's economy had collapsed to a state of zero growth and many companies were suffering. But at the Toyota Motor Company, although profits suffered, greater earnings were sustained in 1975, 1976, and 1977 than at other companies. The widening gap between it and other companies made people wonder what was happening at Toyota” (Ohno, 1988)

The second test was the recent long Heisei economic recession Japan was through during the 1990s and early 2000s. During that difficult period, Toyota, which is the lean company model, was still among the top-earning and one of the most growing companies whereas competitors like Nissan were having problems. Thanks to its lean production methods, Toyota has not only remained the number one producer of cars in Japan, but it has also become the largest manufacturer of cars in the

world.

How can one explain the fact that during periods of economic dire hardships, some companies like Toyota fare well whereas others are not? Mr. Ohno, the father of the lean system sheds some light on this aspect. Mr. Ohno states clearly that Toyota and other companies badly affected by the recession are evolving in the same environment. They are getting the raw materials, say metal sheets to make car bodies with, from the same sources. What makes the difference is the ways companies produce (Ohno, 1978).

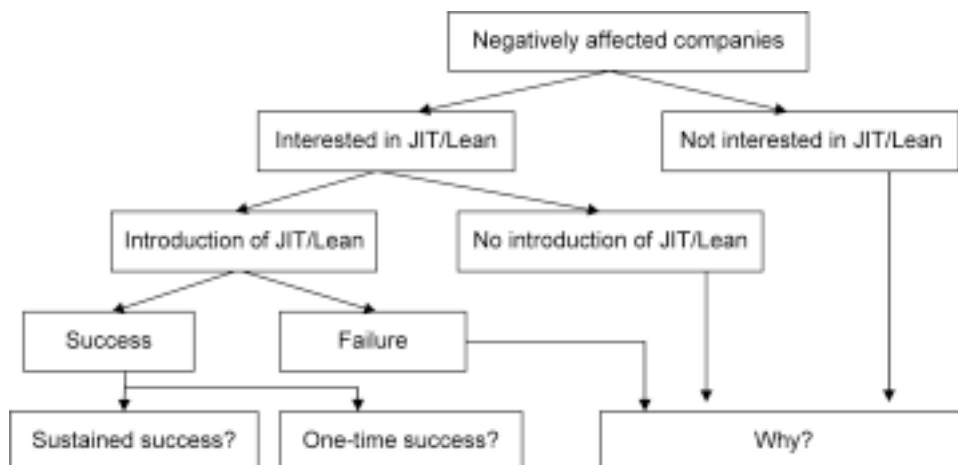
Attitude toward lean production system during economic hardships

A careful examination of negatively-affected (manufacturing) companies' attitude toward the lean system during recession periods has led to classifying such companies into two main groups. The first is made up of those not apparently interested in JIT/Lean. Reasons (sound or not) why companies don't mind using JIT/Lean methods even in such circumstances will be examined later

The second category is constituted by companies apparently interested in JIT/Lean methods. Of those companies, some have indeed introduced JIT/Lean and others have taken no action to. Why even companies interested in JIT/Lean do not try to introduce it? The question will not be dealt with right now.

Of those companies interested in JIT/Lean, some have been successful, but others not. For successful companies, the main issue is how to sustain that success over time. Can a company sustain its success and how long can it (see Kupanhy, 2007)? As for the companies that failed to be successful in their introduction of JIT/Lean, it is important to investigate why they did not succeed. This description of companies' attitude toward JIT/Lean adoption is illustrated in Figure-1

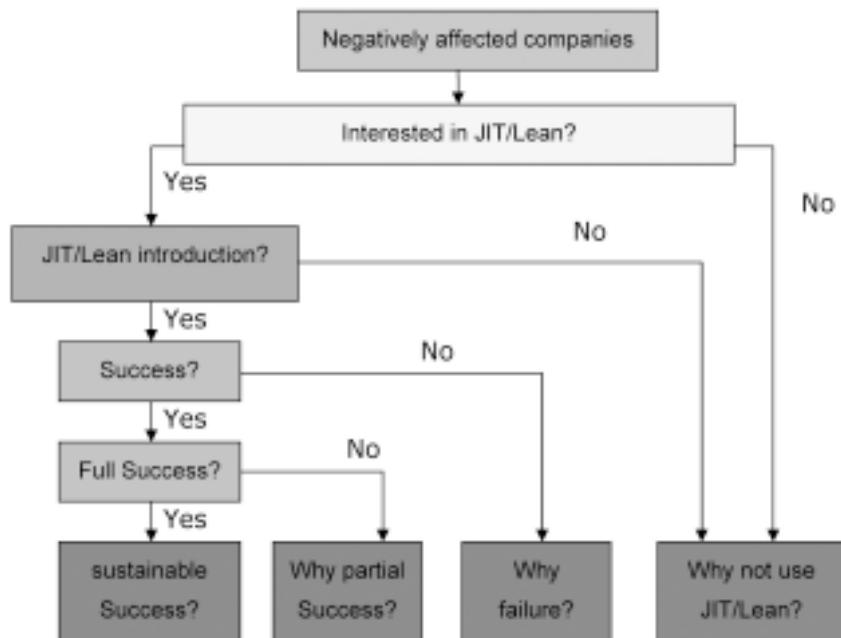
Figure-1 Classification of company attitude toward lean/JIT during hardships



The main underlying assumption here is that lean companies perform well even during hard times. The second assumption is that lean successes are sustained over a long period of time. Kupanhy (2006, 2009) has explained why companies do not sustain lean successes. This paper is focused on why companies having problems are not interested in lean or when interested, they are not taken any action to introduce it whereas it appears to be their best survival option.

In order to make things much clearer about the companies' attitude as regards the JIT/Lean system, the descriptive approach is completed by the investigative method as shown in Figure-2

Figure-2 Investigating approach to companies' attitude toward JIT/Lean



Classification of companies succeeding in JIT/lean introduction

As we can see in Figure-2, there are companies that have been successful in their attempt to introduce JIT/Lean. Of companies with positive results, we might distinguish two groups, those that are/were partially successful and those that enjoy complete success; those that have limited results and those that reap the full advantages of the lean system; those that were once successful but are no more, and those that were and are still and continue to be successful and thus sustain their success like Toyota.

Reasons for being successful and having sustainable success

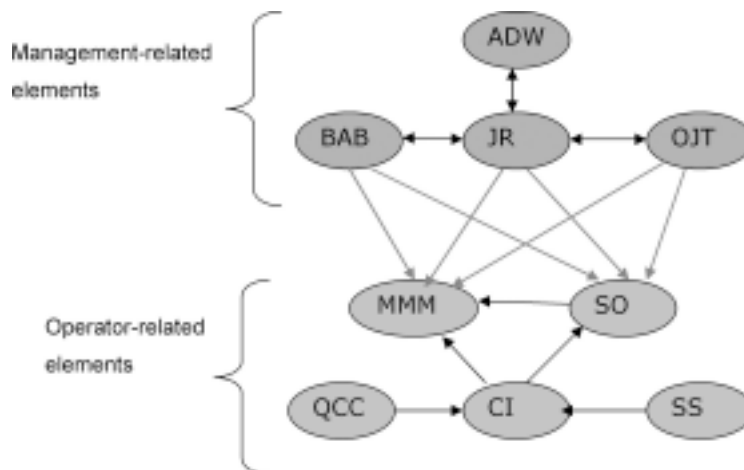
A good understanding of the JIT/Lean as a coherent system with elements related to each others is a decisive factor in being successful.

Years ago, Kupanhy (1995) analyzed and classified JIT system techniques as follows: management-related, operator-related and industrial engineering elements.

Management-related elements feature job rotation (JR), on the job training (OJT), and breaking of administrative barriers between processes (BAB). He pointed to the fact that management involvement and support will consist in providing the framework for OJT, JR and BAB on the one hand, and on the other, in empowering operators so that workers have the power to make autonomous decisions (or autonomous decision by worker: ADW) to stop the process or production line when problems occur.

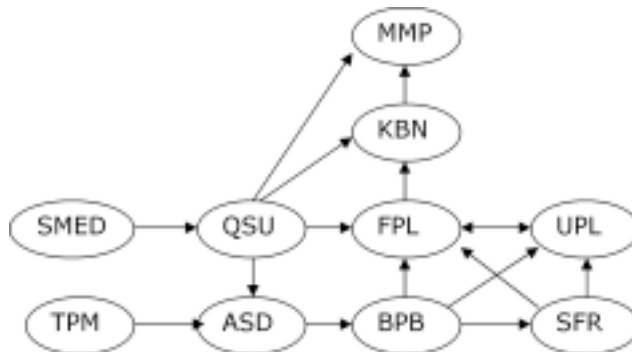
Features related to production operators, such as quality control circles (QCC) and suggestions systems (SS) make up another consistent subsystem of the JIT/Lean system. QCC and SS contribute to and sustain continuous improvement or kaizen (CI). And thanks to kaizen activities, standard operations (SO) can be set without which it would impossible to have operators handle many process and are thus referred to multi-machine manning operators (MMM). The relationship between management-related and operator-related subsystem of the JIT/Lean system are connected by the fact that SO and MMM operations implementation need OJT and also the fact that there should be no barriers between processes (BAB) as shown in Figure-3.

Figure-3 Relationship between management- & operator-related features of the JIT/Lean system



As stated earlier, pure industrial engineering techniques make the third subsystem of the JIT/Lean system. It sports the following features whose consistency or relationship is shown in Figure-4: Total preventive maintenance (TPM), Automatic stopping devices (ASD) or poka yoke, breaking of physical barriers (BPB), shop floor reduction (SFR), quick setup (QSU), flow of product line (FPL), U-formed processing line (UPL), Kanban (KBN), mixed-model production (MMP)

Figure-4 Configuration of pure engineering elements of JIT/Lean



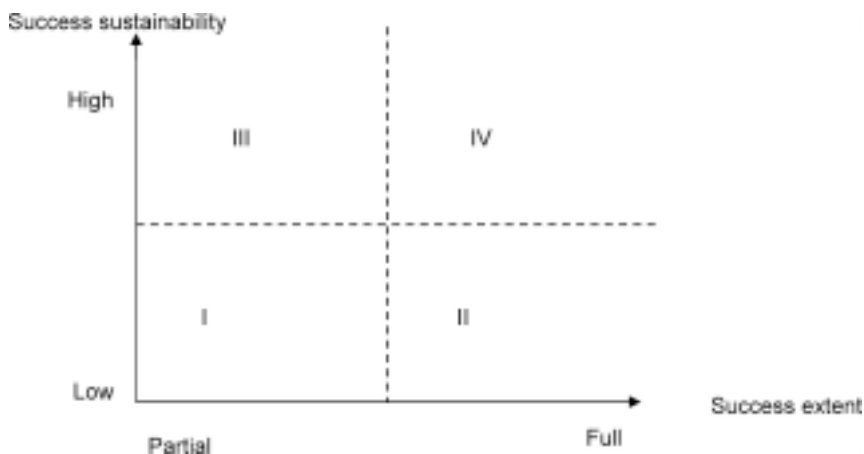
All those elements are affected by CI; MMP would not be possible if we have no UPL, no SFR, FPL, and no BPB; the BAD will make it possible to create a FPL.

In a word, it appears quite clear that all the elements of the JIT/Lean make up a coherent system. The full success of JIT/Lean implies that the internal logical relationship between elements be respected, and that all JIT/Lean elements be implemented. KBN can not be realized if QSU is not yet realized, and MMP is impossible without kanban and QSU. Besides, MMW would be difficult to implement without UPL which in its turn requires the presence of SFR.

JIT/Lean's implementation levels

Besides, analyzing the success of the JIT/Lean implementation shows that success can be sustainable or not on the one hand, and on the other, it can be total or partial (Figure-2). Figure-5 displays the ranges of sustainability as well as the extent of success of JIT/Lean implementation. JIT companies fall in one of the four zones.

Figure-5 Classification of companies according to their success level and success sustainability



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In Zone I would be found companies that consider JIT/Lean as a fashion, or that do not understand well the system as a whole. They would only implement some features of the lean system. In Zone II, all the elements of JIT/lean are implemented, but the lean philosophy of continuous improvement is not well understood. That leads to lean wearing down and fading over time. In the same way, they can introduce the 5S, the implementation of the 4th and 5th S are not well understood and are implemented as one-time endeavor. In Zone III, the JIT/Lean implementation might have been the work of consultants or engineers only that focus on the technical (industrial engineering) aspects only. That leads to sustainable but partial results. Zone IV is where you have the full implementation of the JIT/Lean with the full involvement of both management, engineers, operators and consultants. All the three aspects of the JIT/Lean elements are properly and enthusiastically implemented. Lean becomes here part of the company culture and philosophy. These four zones can be described from the point of view of the implementation level of pure industrial engineering elements and from managerial/operator-related elements as shown in Figure-6.

Figure-5 Implementation levels of JIT/Lean methods

Implementation of pure engineering techniques	Complete	<p>III</p> <p>Partial implementation: Only technical aspects of JIT well mastered and implemented: SMED, Poka Yoke, TPM, BPB, SFR, etc</p>	<p>IV</p> <p>Full implementation: Technical, management and operator-related aspect of JIT/Lean well mastered. Company-wide high involvement from the top management the production floor. Full commitment</p>
	Incomplete	<p>I</p> <p>No real understanding of the JIT/Lean system; No commitment. Fashion approach to the system, or just a management fad or just a slogan</p>	<p>II</p> <p>Full implementation but lack of understanding of JIT/Lean's long-term philosophy. Change of top management resulting in new strategy; layoff of workers resulting in low morale of workers, etc.</p>
	<p>Implementation of managerial and operator-related elements</p>		

Companies in Zone IV have been successful in JIT implementation and at the same time they are able to sustain those successes over time. In Zone I, some elements of JIT/Lean have been implemented but without those elements being considered as part of a consistent system. Both success and sustainability are minimal. In Zone II, although the system was well understood and implemented, its philosophy has not become part of the company culture. In that zone, for instance, QCC have become souvenir of past successes; suggestions have flourished and then dried up. Zone

III may be characterized by work of JIT consultants such as Shingo, Schonberger, Hirano and the contribution from the department of engineers only. This is the predominant pattern identified in Germany where operators are not considered experts and thus are considered not able to contribute to improvement of process, process operations and products. French manufacturing sector is made of a mosaic of companies where one would find companies that fall in both Zone III and Zone II (GM, Caterpillar, Steel Case, Alstom). A subsidiary of Japanese company called SMI Koyo is well situated in zone IV. In Japan, big manufacturing companies are to be found mostly in Zone IV, small ones in zone I, II or III.

As one can see, partial success may be explained by the fact that one may have introduced only JIT engineering elements. Partial implementation can only result at the best in partial success. It might be due to the fact that managerial and operator-related features were not correctly related or are missing because of cultural differences (Kupanhy 2005; Kumon & Abe, 2004). One-time success can be also due to the mobility of the workforce, to the change of top management and strategic change; to the layoff policies that do not encourage continuous improvements (Kupanhy, 2005).

Causes of failure in JIT implementation

The main reason for companies that completely fail in their attempt to introduce JIT/Lean is the complete lack of understanding of the fact that the JIT/Lean methods make up a consistent and coherent system. It is a whole. The secondary reason is due to the superficial understanding of the system. The system is made of three complementary sub-systems. And its implementation requires that for a certain number of its techniques a rigorous order be respected. Not doing so might result in adverse results (see Figures-3 and -4). If you do not respect steps shown in the Figure-3 and Figure-4, the probability of disruption and all the troubles involved increases significantly. It is clear that without quick setup, the kanban system can never be tried, less introduced.

Once one understands how the system works, what is the nature of its elements and how they interact in order to work efficiently, there is no more reason why it could not be applied. Furthermore, it is known to be the cause of sustained successes and competitiveness of companies like Toyota. And history has taught us that companies that were on the verge of going bankrupt regained their competitiveness after properly switching to the lean methods. We have in mind the case of Funai, Mazda and Yanmar of the 1970s and numerous American companies since the 1980s.

In spite of the well documented competitive advantage of the JIT/Lean methods, many companies seem still not interested in Lean methods. Some companies like Nissan (Tochigi Plant) pretend that they tried it but run into problems. That is why they abandoned it. We think that such a reason is not compelling when it comes to justify why you could not succeed where others have. We

think that companies that give up introducing the system at the first hurdle do it in a haste without any long-range consideration. You need to analyze the system, study it, visit the successful companies and then try it again with the full commitment from the whole company. Investing at the short-term for the long-term purpose, weighing the short short-term disruptions vs the lasting long-term returns should be the guiding principle. Funai companies dispatched 100 employees to study the JIT at Toyota for three months in the 1970s. They continue till now harvesting the result of the costly training.

Ignorance-based reasons for not introducing JIT/Lean

When discussing with company executives or some researchers about companies that do not switch to the JIT introduction, one of the most given reasons seems to be the fear inspired by the system. A close look shows that fear is most of the time based on their ignorance of the system.

1. During a presentation I made at the Annual Conference of Productions and Operations Management in Chicago in 2005 about the advantages of JIT, a researcher from England told me that the system was too complex and difficult to implement. He cited the case of Nissan that was not able to introduce it at its British plant. First Nissan could not be successful in JIT implementation abroad whereas it has not at home in Japan. As for the complexity, Schonberger (1986, 1987) has clearly exposed the simplicity of the system compared to conventional production methods. Many ignore thus that simplicity is the core characteristics of JIT/Lean system. Failure is the reason to try again to implement JIT: failure is the motor of improvement.
2. Some have pointed to the cultural differences between Japan and other countries. Kuran has rightly shown the limits of the system in a different cultural environment. But he has also shown that the management features specific to Japanese environment might be substituted by local feature. Besides, engineering elements of the JIT/Lean system can work perfectly in any cultural or particular management settings. Many companies in the USA have been successful in their implementation of JIT/lean system (Lu, 1989; Kumon et al. (2004, 1996?), Schonberger (1987). If culture was an obstacle, why many Japanese companies even here in Japan that do not use JIT/Lean? Not knowing that the system can work and do work even in different management setting is only based on pure ignorance.
3. Many companies would not try introducing JIT/lean or would justify their failure in its introduction attempt by explaining that the system works much better in the automotive sector. This ignorance is the same as stating that the mass production, the simplification of work, standardization of work initiated by Ford would work only in the automobile industry. This is due to the ignorance that even a sushi company can use JIT/lean system.

4. Some companies pretend that because they are small, they cannot master such a perfect and expensive system. This is pure ignorance. The system is not expensive, and its perfection is the results of it becoming part of the company culture. The system can be implemented at the plant level and a plant is a plant, regardless of the size of the company it belongs to. Regardless of the company size, its plant can implement JIT/Lean.
5. We have no experts; not enough resource to afford experts. This is the most costly ignorance. Why don't you try to use first your own experts? Doesn't someone who has spent years handling a process know that process better than anyone else? In JIT/lean companies, employees are experts of their company: operators are experts of the process they are charge of. Use first your in-house expertise; know you limit and then seek external expertise. Create your own experts through job rotation, standardize your work. After using in-house experts, when you really can't, then look for external experts.
6. The production lead time is too long. We need stock. This means only that you ignore the existence of the SMED techniques.

Conclusion

As we can see, the main reasons why companies do not switch to lean methods is their ignorance of the system. That is why we would say there are no real and convincing reasons for not using JIT/Lean methods. Only the ignorance of the system is the main obstacle to its implementation in many companies. Because the system is now known, is there any excuse for not using it? How long can we keep tolerating your ignorance?

It is contradictory to see that the very same reasons for which companies should switch to JIT/Lean production system are the ones that keep them away from introducing JIT. The system itself is lean: simplicity of production, simplicity of inventory management based on simple cards, flexibility of work force, less investment, less people, less space, less transportation, higher results. It is your ignorance that keeps your companies from switching to lean production system.

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